

REMARKS

Claims 1-11 are all the claims pending in the application. All of the Examiner's objections to the specification and the claims and rejections to the claims in the Final Office Action are addressed below.

Objection to the Drawings

Specifically, the Examiner states that full details of the calculation and the concept of pattern quantization value as claimed, must be shown in the drawings. Although Applicants previously submitted that "the calculation of pattern quantization value is a conventional feature disclosed in the description," the Examiner states that the Applicants are required to explicitly state that the terminology is conventional. Therefore, Applicants explicitly state that the pattern quantizing value is conventional and respectfully submit that their detailed illustration or description is not essential for a proper understanding of the invention. *See M.P.E.P. 608.02(d).*

Objection to the July 21, 2004 Amendment for Adding New Matter

The Examiner objects to the changes to the claims where "until" was replaced with -- while--, as shown below in claim 1:

(c) increasing a threshold value until while a pattern quantizing value is retained, and denoising the decomposed data; and

Applicants respectfully submit that the changes to the claims do not add new matter and are fully supported in the original disclosure.

FIG. 1 show an exemplary embodiment of the invention which provides support for the changes to the claims. Figure 1 and lines 3-5 on page 9 of the specification show that "if the

previous pattern quantizing value is identical to the current pattern quantizing value [in step 110], the threshold value is *increased* (step 112) to perform step 106.” (Emphasis added). Moreover, the specification shows that “the previous quantizing value [being] identical to the current quantizing value means that pattern regularity has not changed and has been *retained*.” Lines 17-20 of page 8 (emphasis added). Thus, the specification provides support for a threshold value that is increased *while* the previous pattern quantization is retained. In view of the above, Applicants request the Examiner to withdraw the objection and enter changes to the claims in the July 21, 2004 Amendment.

Rejection Of Claims 1-11 Under § 112, First Paragraph

Claims 1-11 are rejected for failing to comply with the written description requirement because of the recitation of “while” in the claims. Applicants submit that the Applicants’ response to the Examiner’s claim objections as shown above shows that the claims comply with the written description requirement.

Claims 1-11 are rejected for failing to comply with the enablement requirement. Applicants submit that “pattern quantizing value,” is a conventional term of art which relates to a value which represents the quantization of a pattern in an image. In the Applicants’ invention, pattern quantizing value represents the quantization of a projected image. In other words, the terms relate to a mechanism for representing the projected image. *See* lines 9-11, page 6.

In addition, Applicants submit “A texture descriptor for browsing and similarity retrieval” (Signal Processing: Image Communication, 2000). The underlined sections on pages

3-4 and 6, and Fig. 6 on page 7 show examples of “*Regularity*.” Applicants submit that “*Regularity* (v_1)” is an example of a pattern quantizing value that is conventionally used.

As for claim 11, Applicants submit that “increasing the threshold value until the pattern quantizing value changes,” is fully supported in the original disclosure, as shown in the discussions above.

Rejection Of Claims 1-11 Under § 112, Second Paragraph

Claims 1-11 are rejected as being indefinite because the specification does not explain what is meant by pattern quantizing value and how the threshold value works in conjunction with the pattern quantizing value. In addition to the above explanations of the pattern quantizing value, Applicants submit the following.

Noise in an image may make it difficult to perceive patterns in the image for image recognition or pattern matching. *See* lines 12-16, page 1. In conventional techniques to remove noise, i.e., denoising, additional problems arise in that the pattern itself can be altered. *See* lines 14-17, page 2. An aspect of the Applicants’ invention is to denoise images without modifying the pattern in the image. In Fig. 1, an image is represented by a pattern quantization value (steps 102, 103). Then the image is denoised at a predetermined threshold level (steps 104, 106) and another pattern quantization value is calculated for the denoised image (step 108). A comparison is made between a previous pattern quantization value and a current pattern quantization value (step 110). If it is determined that the previous and the current pattern quantization values are the same, threshold level is increased (step 112) and the image is denoised at the increased threshold level.

With the above, Applicants submit that the specification is definite in providing a clear explanation of how the threshold value works in conjunction with the pattern quantizing value.

Prior Art Rejections

Claims 1, 3-5 and 9-11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Nakagawa (U.S. Patent No. 5,291,282; hereinafter “Nakagawa”) and Katsuyama (U.S. Patent No. 6,771,813; hereinafter “Katsuyama”). Claims 2 and 6 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Nakagawa and Katsuyama as applied to claim 1 above, and further in view of Acharya (U.S. Patent No. 6,574,374; hereinafter “Acharya”). Applicants submit the following in traversal of the claim rejections.

Rejection of Claims 1, 3-5, and 9-11 under § 103(a) over Nakagawa and Katsuyama

Applicants respectfully submit that claim 1 is believed to be patentable because Nakagawa and Katsuyama fail to teach, suggest, or provide motivation for:

A method of describing pattern repetitiveness of an image comprising the steps of:

- (a) projecting an image on a predetermined axis having a predetermined direction;
- (b) decomposing the projected image down one level;
- (c) increasing a threshold value while a pattern quantizing value is retained, and denoising the decomposed data; and
- (d) describing pattern repetitiveness of the image using the pattern quantizing value of the denoised data and the threshold value used for denoising.

In the Office Action, the Examiner states that Nakagawa fails “to explicitly teach the concept of projecting an image on a predetermined axis having a predetermined direction,” but that Katsuyama discloses such a feature. Specifically, the Examiner points out FIGS. 13a, 17, and column 5, line 40, as corresponding to the claimed step of projecting an image.

Figure 13a of Katsuyama, however, merely discloses a method for storing information about rectangles overlapping in a search range around a target rectangle. *See* col. 24, lines 1-4. The detailed description of FIG. 13a shows that the method involves determining the positions of the *enclosing rectangles* 71 and 72 with respect to two axes. *See* col. 24, lines 5-14. Figure 13a and the corresponding sections of the detailed description do not disclose any kind of *image* projection on an axis. Moreover, FIG. 17 discloses obtaining an enclosing rectangle 87 enclosing the label image 88. *See* Col. 28, lines 47-53. Then, the *outline* of the label image 88 can be obtained by scanning the range of the enclosing rectangle. As is the case with FIG. 13a, the enclosing rectangle 87 of FIG. 17 merely shows positional information and no mention is made of projecting an image. Lastly, col. 5, lines 37-40 only disclose that an outline of a pattern in an image is computed based on a certain frequency when the image is scanned in a predetermined direction. Again, such disclosure still fails to disclose the projecting an image on a predetermined axis.

In addition, Applicants submit that claim 1 is believed to be patentable because Nakagawa and Katsuyama fail to disclose or suggest increasing a threshold value while a pattern quantizing value is retained, and denoising the decomposed data, in combination with other elements of the claim. As previously noted by the Applicants, the sections of Nakagawa cited by the Examiner disclose that check processing is performed until “the amount of codes *approaches*

close enough to the target amount of codes by the check processing.” Col. 30, lines 63-65 (emphasis added). In other words, the criteria for repetitively performing check processing is if a certain number approaches a target number. This, however, is entirely different from increasing a threshold value while a pattern quantizing value is retained.

Therefore, for the above reasons, claim 1 is believed to be patentable.

For reasons similar to those submitted for the patentability of claim 1, claims 5, 9, and 10 are believed to be patentable.

Claims 3, 4, and 11, which depend from claim 1, and claims 7 and 8, which depend from claim 5, are believed to be patentable for the reasons submitted for claims 1 or 5.

Rejection of Claims 2 and 6 under § 103(a) over Nakagawa, Katsuyama, and Acharya

Claims 2 and 6, which depend from claims 1 and 5, respectively, are believed to be patentable for at least the reasons submitted for claim 1 and because Acharya fails to make up for the deficiencies of Nakagawa and Katsuyama.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

Response Under 37 C.F.R. § 1.116
U.S. Appln No. 09/822,838

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The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



Seok-Won Stuart Lee*

*Granted limited recognition under
37 C.F.R. § 11.9(b), as shown in a copy of
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